

Table 1. Demographic and exposure characteristics for 100 Marietta residents and 86 East Liverpool Residents, 2009-2011.

Resident characteristic	Marietta (n=100)	East Liverpool (n=86)	Differences by town
Categorical characteristics	N (%)	N (%)	p-value
Sex			
Male	45 (45.0)	31 (36.1)	
Female	55 (55.0)	55 (63.9)	0.22
Employment status			
Unemployed	39 (39.0)	38 (44.7)	
Employed/student	61 (61.0)	47 (55.3)	0.43
Annual household income			
\$0 to \$19,999	11 (11.9)	22 (28.2)	
\$20,000 to \$39,999	26 (28.3)	23 (29.5)	
\$40,000 to \$69,999	25 (27.2)	13 (16.7)	
\$ 70,000 and above	30 (32.6)	20 (25.6)	0.04
Continuous characteristics	Mean ± SD	Mean ± SD	p-value
Age	54.4±9.9	56.0±11.9	0.28
Years of education	14.6±2.7	12.9±2.2	<0.0001
Body mass index *	28.9±6.4	27.4±5.6	0.17
Serum ferritin, µg/L			
Male	189.6±180.3	215.3±177.3	0.34
Female	85.2±107.5	93.2±120.8	0.91
Blood cadmium, µg/L	0.53±0.53	0.71±0.62	0.005
Blood mercury, µg/L	1.38±1.89	0.55±0.41	<0.0001
Blood lead, µg/L	15.6±9.52	16.4±11.0	0.57
Blood manganese, µg/L			
Male	8.83±1.87	10.14±3.24	0.04
Female	10.3±3.88	10.42±3.97	0.93
Years of residence in town	36.1±15.8	47.0±16.4	<0.0001
Distance from Mn source (air miles)	4.75±1.64	1.12±0.493	<0.0001
Mn air concentration, µg/m <sup>3</sup>	0.184±0.131	0.269±0.376	0.001

\* BMI missing for 8 Marietta and 3 East Liverpool participants

Table 2. Bivariate associations between motor function tests and indicators of exposure to air-Mn in 100 residents in Marietta and 86 residents in East Liverpool, Ohio.

Motor test	Marietta Mean±SD	EL Mean±SD	Town differences t-statistic <sup>1</sup> (p-value)	Distance from source Correlation <sup>2</sup> (p-value)
Finger Tapping, dominant hand	47.89±10.97	40.89±8.50	4.88 (<0.0001)	0.29 (<0.0001)
Finger Tapping, non-dominant hand	46.41±9.36	41.41±9.64	3.57 (0.0005)	0.19 (0.008)
Dynamometer, dominant hand	36.57±8.63	30.55±8.41	4.77 (<0.0001)	0.22 (0.003)
Dynamometer, non-dominant hand	37.93±8.93	33.43±7.48	2.99 (0.003)	0.14 (0.053)
Grooved pegboard, dominant hand	49.86±9.79	45.99±11.23	2.51 (0.013)	0.19 (0.008)
Grooved pegboard non-dominant hand	48.75±10.26	46.98±11.07	1.13 (0.26)	0.15 (0.048)

<sup>1</sup> T-test except for grooved pegboard non-dominant hand which used a Wilcoxon 2-sample test

<sup>2</sup> Spearman correlation coefficient

Table 3. Bivariate associations between age-adjusted tremor test z-scores and indicators of exposure to air-Mn in 100 residents in Marietta and 86 residents in East Liverpool, Ohio.

Tremor test	Marietta Mean±SD	EL Mean±SD	Town differences t-statistic <sup>1</sup> (p-value)	Distance from source Correlation <sup>2</sup> (p-value)
Intensity, right hand	0.12±0.08	0.13±0.05	2.05 (0.04)	-0.18 (0.02)
Center Frequency , right hand	4.29±2.00	7.96±2.28	9.05 (<0.0001)	-0.52 (<0.0001)
Harmonic Index , right hand:	0.95±0.02	0.83±0.06	3.43 (0.0007)	0.27 (0.0002)
Intensity , left hand	0.13±0.10	0.13±0.05	2.32 (0.02)	-0.17 (0.02)
Center Frequency, left hand	4.16±2.12	7.96±2.37	8.89 (<0.0001)	-0.54 (<0.0001)
Harmonic Index, left hand:	0.95±0.02	0.83±0.06	7.97 (<0.0001)	0.51 (<0.0001)

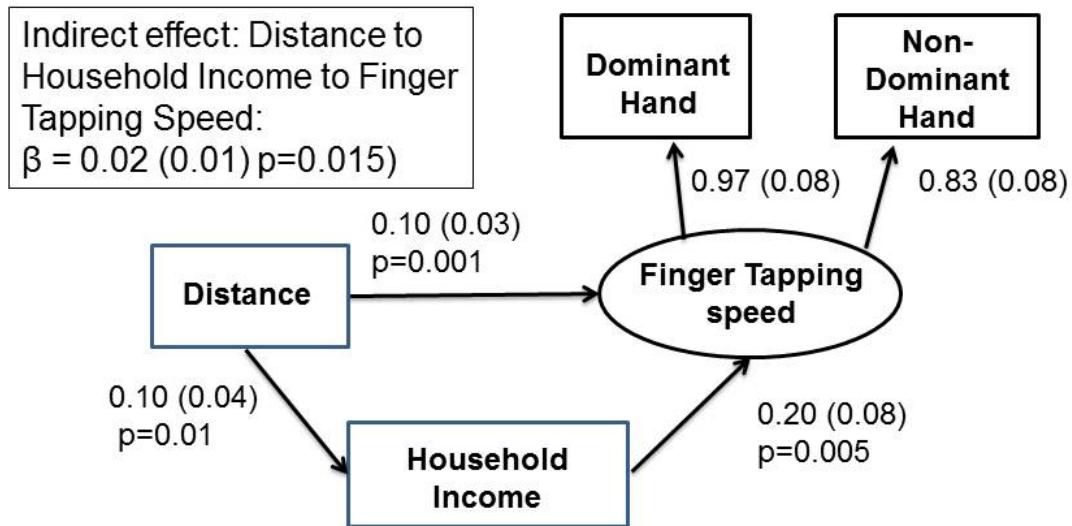
<sup>1</sup> Wilcoxon 2-sample test

<sup>2</sup> Spearman correlation coefficient

Table 4. Spearman correlations (p-values) between measures of tremor and motor function.

	Finger Tapping Dominant Hand	Finger Tapping Non-Dominant Hand	Dynamometer Dominant Hand	Dynamometer Non-Dominant Hand	Grooved Pegboard Dominant Hand	Grooved Pegboard Non-Dominant Hand
Center Frequency, Left Hand	-0.31 (<0.0001)	-0.25 (0.0007)	-0.26 (0.0004)	-0.20 (0.007)	-0.09 (0.21)	-0.03 (0.69)
Center Frequency, Right Hand	-0.27 (0.0002)	-0.23 (0.0018)	-0.21 (0.004)	-0.10 (0.16)	-0.04 (0.59)	0.00 (0.97)
Harmonic Index, Left Hand	0.23 (0.0016)	0.21 (0.004)	0.25 (0.0006)	0.18 (0.01)	0.11 (0.13)	-0.02 (0.80)
Harmonic Index, Right Hand	0.14 (0.05)	0.28 (0.0002)	0.12 (0.09)	0.08 (0.28)	0.09 (0.22)	0.05 (0.53)
Tremor Intensity, Left Hand	-0.13 (0.07)	-0.13 (0.07)	-0.15 (0.04)	-0.005 (0.95)	-0.03 (0.64)	-0.10 (0.20)
Tremor Intensity, Right Hand	-0.11 (0.12)	-0.10 (0.18)	-0.10 (0.18)	0.07 (0.36)	-0.06 (0.40)	-0.10 (0.16)

Figure 1. Structural equation modeling showing that household income significantly partially mediates the association between distance from the Mn source and finger-tapping speed in East Liverpool and Marietta residents, 2009-2011.



Note: Standardized based on variance of latent finger tapping speed domain